



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We make Indiana a cleaner, healthier place to live.

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Mr. Scott Christensen
Koch Fertilizer Storage and Terminal Company
7438 East County Road 800 S
Walton, Indiana 46994

January 6, 2003

Dear Mr. Christensen:

Re: Exempt Operation Status,
017-16725-00042

The application from Koch Fertilizer Storage and Terminal Company, received on November 1, 2002, has been reviewed. Based on the data submitted and the provisions in 326 IAC 2-1.1-3, it has been determined that the following ammonia terminal, to be located at 7438 East County Road 800 S, Walton, Indiana, is classified as exempt from air pollution permit requirements:

- (a) Two (2) propane-fired ammonia heaters, designated as H-1 and H-2, both constructed in 1998, with a maximum heat input rates of 15 million British thermal units per hour and 22.9 million British thermal units per hour, respectively, exhausting to stacks H1 and H2, respectively.
- (b) Eight (8) propane-fired vaporizer units, designated as V-1 through V-8, both constructed in 1998, each having a maximum heat input rate of 0.08 million British thermal units per hour.
- (c) Two (2) emergency propane-fired ammonia flares, designated as F-1 and F-2, both constructed in 1998, each having a maximum heat input rate of 1.14 million British thermal units per hour, exhausting to stacks F1 and F2, respectively.

The following conditions shall be applicable:

- (1) Pursuant to 326 IAC 5-1-2 (Opacity Limitations) except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following:
 - (a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
 - (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of 15 minutes (60 readings) in a 6-hour period as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor in a six (6) hour period.
- (2) Pursuant to 326 IAC 6-4 (Fugitive Dust Emissions), the Permittee shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions).

An application or notification shall be submitted in accordance with 326 IAC 2 to the Office of Air Quality (OAQ) if the source proposes to construct new emission units, modify existing emission units, or otherwise modify the source.



Pursuant to Contract No. A305-0-00-36, IDEM, OAQ has assigned the processing of this application to Eastern Research Group, Inc., (ERG). Therefore, questions should be directed to Kristin Clapp, ERG, 1600 Perimeter Park Drive, Morrisville, North Carolina 27560, or call (703) 633-1694 to speak directly to Ms. Clapp. Questions may also be directed to Duane Van Laningham at IDEM, OAQ, 100 North Senate Avenue, P.O. Box 6015, Indianapolis, Indiana, 46206-6015, or call (800) 451-6027, press 0 and ask for Duane Van Laningham, or extension 3-6878, or dial (317) 233-6878.

Sincerely,

Original signed by
Paul Dubenetzky, Chief
Permits Branch
Office of Air Quality

ERG/KC

cc: File - Cass County
Cass County Health Department
Air Compliance - Marc Goldman
Permit Tracking - Sara Cloe
Technical Support and Modeling - Michele Boner
Compliance Branch - Karen Nowak

January 6, 2003

**Indiana Department of Environmental Management
Office of Air Quality**

Technical Support Document (TSD) for an Exemption

Source Background and Description

Source Name: Koch Fertilizer Storage and Terminal Company
Source Location: 7438 East County Road 800S, Walton, Indiana 46994
County: Cass
SIC Code: 4226
Operation Permit No.: E017-16725-00042
Permit Reviewer: ERG/KC

The Office of Air Quality (OAQ) has reviewed an application from Koch Fertilizer Storage and Terminal Company relating to the operation of an ammonia terminal.

Permitted Emission Units and Pollution Control Equipment

The source consists of the following permitted emission units and pollution control devices:

- (a) Two (2) propane-fired ammonia heaters, designated as H-1 and H-2, both constructed in 1998, with a maximum heat input rates of 15 million British thermal units per hour and 22.9 million British thermal units per hour, respectively, exhausting to stacks H1 and H2, respectively.
- (b) Eight (8) propane-fired vaporizer units, designated as V-1 through V-8, both constructed in 1998, each having a maximum heat input rate of 0.08 million British thermal units per hour.
- (c) Two (2) emergency propane-fired ammonia flares, designated as F-1 and F-2, both constructed in 1998, each having a maximum heat input rate of 1.14 million British thermal units per hour, exhausting to stacks F1 and F2, respectively.

Unpermitted Emission Units and Pollution Control Equipment

There are no unpermitted facilities operating at this source during this review process.

New Emission Units and Pollution Control Equipment Receiving Prior Approval

There are no new construction activities included in this permit.

Existing Approvals

The source has constructed or has been operating under the following previous approvals:

- (a) E017-15103-00042, issued January 7, 2002; and

(b) CP017-8982-00042, issued January 5, 1998.

All terms and conditions from previous permits issued pursuant to permitting programs approved into the state implementation plan have been either incorporated as originally stated, revised, or deleted by this permit. All previous registrations and permits are superseded by this permit.

The following terms and conditions from previous approvals have been determined no longer applicable; therefore, were not incorporated into this Part 70 permit:

All construction conditions from all previously issued permits.

Reason not incorporated: All facilities previously permitted have already been constructed; therefore, the construction conditions are no longer necessary as part of the operating permit. Any facilities that were previously permitted but have not yet been constructed would need new pre-construction approval before beginning construction.

Enforcement Issue

There are no enforcement actions pending.

Stack Summary

| Stack ID | Operation | Height (feet) | Diameter (feet) | Flow Rate (acfm) | Temperature (°F) |
|----------|------------|---------------|-----------------|------------------|------------------|
| H1 | Heater H-1 | 28 | 1.7 | 6,000 | 800 |
| H2 | Heater H-2 | 28 | 1.5 | 8,500 | 800 |
| F1 | Flare F-1 | 80 | 0.3 | 25.4 | 1,200 |
| F2 | Flare F-1 | 80 | 0.5 | 25.4 | 1,200 |

Recommendation

The staff recommends to the Commissioner that the operation be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

A complete application for the purposes of this review was received on November 1, 2002.

Emission Calculations

See Appendix A (pages 1 through 8) of this document for detailed emissions calculations.

Potential To Emit of Source Before Controls

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as “the maximum capacity of a stationary source or emissions unit to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA, the department, or the appropriate local air pollution control agency.”

| Pollutant | Potential To Emit (tons/year) |
|-----------------|-------------------------------|
| PM | 0.20 |
| PM-10 | 0.20 |
| SO ₂ | 0 |

| | |
|-----------------|------|
| VOC | 1.22 |
| CO | 1.03 |
| NO _x | 6.51 |

Note: Fugitive PM and PM10 emissions are not shown here because this source is not 1 of the 28 listed source categories and this source is not subject to a New Source Performance Standard that was in effect on August 7, 1980. Therefore, fugitive PM and PM10 emissions are not counted when determining permitting status.

| | |
|-------|-------------------------------|
| HAP's | Potential To Emit (tons/year) |
| TOTAL | Negligible |

- (a) The potential to emit (as defined in 326 IAC 2-7-1(29)) of criteria pollutants is less than 100 tons per year. Therefore, the source is not subject to the provisions of 326 IAC 2-7.
- (b) The potential to emit (as defined in 326 IAC 2-7-1(29)) of criteria pollutants is less than 25 tons per year. Therefore, the source is not subject to the provisions of 326 IAC 2-6.1.
- (c) The potential to emit (as defined in 326 IAC 2-7-1(29)) of pollutants is less than the levels listed in 326 IAC 2-1.1-3(d)(1), therefore, the source is subject to the provisions of 326 IAC 2-1.1-3.
- (d) The potential to emit (as defined in 326 IAC 2-7-1(29)) of any single HAP is less than ten (10) tons per year and/or the potential to emit (as defined in 326 IAC 2-7-1(29)) of a combination of HAPs is less than twenty-five (25) tons per year. Therefore, the source is not subject to the provisions of 326 IAC 2-7.
- (e) Fugitive Emissions
Since this type of operation is not one of the twenty-eight (28) listed source categories under 326 IAC 2-2 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive particulate matter (PM) and volatile organic compound (VOC) emissions are not counted toward determination of PSD and Emission Offset applicability.

County Attainment Status

The source is located in Cass County.

| Pollutant | Status |
|-----------------|------------|
| PM-10 | Attainment |
| SO ₂ | Attainment |
| NO ₂ | Attainment |
| Ozone | Attainment |
| CO | Attainment |
| Lead | Attainment |

- (a) Volatile organic compounds (VOC) are precursors for the formation of ozone. Therefore, VOC emissions are considered when evaluating the rule applicability relating to the ozone standards. Cass County has been designated as attainment or unclassifiable for ozone. Therefore, VOC emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.
- (b) Cass County has been classified as attainment or unclassifiable for all criteria pollutants and lead. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.
- (c) Fugitive Emissions
Since this type of operation is not one of the 28 listed source categories under 326 IAC

2-2, 40 CFR 52.21, or 326 IAC 2-3 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive particulate matter (PM) and volatile organic compound (VOC) emissions are not counted toward determination of PSD and Emission Offset applicability.

Source Status

Existing Source PSD, Part 70 or FESOP Definition (emissions after controls, based on 8,760 hours of operation per year at rated capacity and/ or as otherwise limited):

| Pollutant | Emissions (ton/yr) |
|-----------------|-----------------------|
| PM | 0.20 |
| PM10 | 0.20 |
| SO ₂ | 0 |
| VOC | 1.22 |
| CO | 1.03 |
| NO _x | 6.51 |

- (a) This existing source is **not** a major stationary source because no attainment regulated pollutant is emitted at a rate of 250 tons per year or more, and it is not in one of the 28 listed source categories.
- (b) These emissions were based on the emission calculations include in Appendix A.

Part 70 Permit Determination

326 IAC 2-7 (Part 70 Permit Program)

This existing source, including the emissions from this permit, is not subject to the Part 70 Permit requirements because the potential to emit (PTE) of:

- (a) each criteria pollutant is less than 100 tons per year,
- (b) a single hazardous air pollutant (HAP) is less than 10 tons per year, and
- (c) any combination of HAPs is less than 25 tons/year.

This status is based on all the air approvals issued to the source. This status has been verified by the OAQ inspector assigned to the source.

Federal Rule Applicability

- (a) There are no New Source Performance Standards (NSPS)(326 IAC 12 and 40 CFR Part 60) applicable to this source.
- (b) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs)(326 IAC 14 and 40 CFR Part 63) applicable to this source.
- (c) This source is not subject to the provisions of 40 CFR 64, Compliance Assurance Monitoring. In order for this rule to apply, a specific emissions unit must meet three criteria for a given pollutant: 1) the unit is subject to an emission limitation or standard for the applicable regulated air pollutant, 2) the unit uses a control device to achieve compliance with any such emission limitation or standard, and, 3) the unit has potential pre-control device emissions of the applicable regulated air pollutant that are equal or greater than 100 percent of the amount required for a source to be classified as a major source. For this source, no facility has the potential to emit greater than 100 percent of the amount required for a source to be classified as a major source. Additionally, this source is not a Part 70 source. For these reasons, the requirements of 40 CFR 64, Compliance Assurance Monitoring does not apply.

- (d) The requirements of Section 112(j) of the Clean Air Act (40 CFR Part 63.50 through 63.56) are not applicable to this source because (1) the source is not a major source of HAPs (i.e., the source does not have the potential to emit 10 tons per year or greater of a single HAP or 25 tons per year or greater of a combination of HAPs) (and/or 2) the source does not include one or more units that belong to one or more source categories affected by the Section 112(j) MACT Hammer date of May 15, 2002.

State Rule Applicability - Entire Source

326 IAC 2-2 (Prevention of Significant Deterioration)

This source is not subject to the requirements of 326 IAC 2-2 (Prevention of Significant Deterioration) because this source does not have the potential to emit greater than two hundred fifty (250) tons per year of any criteria pollutant and this source is not one (1) of the twenty-eight (28) listed source categories.

326 IAC 2-4.1 (Hazardous Air Pollutants)

This source is not subject to the requirements of 326 IAC 2-4.1 (Hazardous Air Pollutants) even though this source was constructed after July 27, 1997 because this source does not have the potential to emit greater than ten (10) tons per year of a single HAP or greater than twenty-five (25) tons per year of any combination of HAPs.

326 IAC 2-6 (Emission Reporting)

This source is located in Cass County and the potential to emit all criteria pollutants is less than one hundred (100) tons per year. Therefore, 326 IAC 2-6 does not apply.

326 IAC 5-1 (Visible Emissions Limitations)

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:

- (a) Opacity shall not exceed an average of forty percent (40%) any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)

No facility at this source is subject to the requirements of 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes) because the only sources of particulate emissions at this source are combustion and fugitive emissions from unpaved roads.

326 IAC 6-4 (Fugitive Dust Emissions)

The Permittee shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions).

326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations)

This source is not subject to the requirements of 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations) because this source was constructed after 1985 and this source does not have the potential to emit twenty-five (25) tons per year of fugitive particulate matter.

326 IAC 8-1-6 (New Facilities - General Reduction Requirement)

No facility at this source is subject to the requirements of 326 IAC 8-1-6 (New Facilities - General Reduction Requirement) even though this source was constructed after January 1, 1980 because no facility has the potential to emit greater than twenty-five (25) tons of VOC per year.

State Rule Applicability - Ammonia Heaters

326 IAC 6-2 (Particulate Emission Limitations for Sources of Indirect Heating)

The two (2) ammonia heaters, H-1 and H-2, are not subject to the requirements of 326 IAC 6-2 (Particulate Emission Limitations for Sources of Indirect Heating) because these units are not boilers. These facilities heat the ammonia directly.

Conclusion

The operation of this ammonia terminal shall be subject to the conditions of the attached proposed Exemption 017-16725-00042.

Appendix A: Emission Calculations

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Heater 1 and 2 Emission Calculations

Company Name: Koch Fertilizer Storage and Terminal Company
Address City IN Zip: 7438 East County Road 800S, Walton, IN 46994
Permit Number: 017-16725-00042
Plt ID: 017-00042
Reviewer: ERG/KC
Date: 11/14/2002

Note that when ammonia enters this process through a pipeline, it follows 1 of 2 paths: 1) it can be loaded directly onto trucks to be shipped out; or 2) it can be refrigerated so that it may be stored in 1 of 2 tanks. Before ammonia is loaded onto trucks from the storage tanks, it must be heated.

The heaters can only operate if cold ammonia flows through them. Ammonia enters the process at high pressure. The ammonia is then cooled by the refrigeration system and stored in tanks. When the cold ammonia is removed from the tank, it must be heated before being loaded on trucks to be shipped out. The maximum amount of ammonia that can be processed by the refrigeration system and can therefore flow through the heaters is 260,000 tons per year. The refrigeration system serves as a bottleneck to the amount of ammonia that can be distributed to the heaters. For this reason, the maximum hours of operation for the heaters is calculated assuming a flowrate of 260,000 tons of ammonia per year.

In order to determine the worst case scenario, these emission calculations assume all 260,000 tons per year goes through each of the heaters.

| | Heat Input Capacity MMBtu/hr | Potential Throughput kgals/year | SO ₂ Emission factor = 0.10 x S S = Sulfur Content = | 0.16 grains/100ft ³ |
|----------|---------------------------------|------------------------------------|--|--------------------------------|
| Heater 1 | 15.00 | 430.94 | | |
| Heater 2 | 22.90 | 526.32 | | |

| Emission Factor in lb/kgal | Pollutant | | | | | |
|--|-----------|-------|-----------------|-----------------|---------------------|------|
| | PM* | PM10* | SO ₂ | NO _x | VOC | CO |
| | 0.60 | 0.60 | 0.02 (0.10S) | 19.00 | 0.50 **TOC value | 3.20 |
| Heater 1 Potential Emission in tons/yr | 0.13 | 0.13 | 0.00 | 4.09 | 0.11 | 0.69 |
| Heater 2 Potential Emission in tons/yr | 0.16 | 0.16 | 0.00 | 5.00 | 0.13 | 0.84 |

**The VOC value given is TOC. The methane emission factor is 0.2 lb/kgal.

Methodology

1 gallon of propane has a heating value of 90,500 Btu (use this to convert emission factors to an energy basis for propane)

(Source - AP-42 (Supplement B 10/96) page 1.5-1)

Potential Throughput (kgals/year) = Heat Input Capacity (MMBtu/hr) x 2,600 hrs/yr for Heater 1 or 2,080 hrs/yr for Heater 2 x 1kgal per 1000 gallon x 1 gal per 0.0915 MMBtu

Emission Factors are from AP42 (Supplement B 10/96), Table 1.5-1 (SCC #1-02-010-02)

Emission (tons/yr) = Throughput (kgals/yr) x Emission Factor (lb/kgal) / 2,000 lb/ton

Appendix A: Emission Calculations

App A, Page 2 of 8

Vaporizers #1 through #8

Company Name: Koch Fertilizer Storage and Terminal Company
Address City IN Zip: 7438 East County Road 800S, Walton, IN 46994
Permit Number: 017-16725-00042
Plt ID: 017-00042
Reviewer: ERG/KC
Date: 11/14/2002

Heater Fuel Type: Propane
Fuel Heat Content: 90,500 Btu/gallon
Heat Duty of Heater: 0.08 MMBtu/hr
Fuel Consumption: 0.88 gallon/hr
Hours of Operation: 8760 hr/yr
Number of Vaporizers: 8
Sulfur Content of Fuel: 0.16 gr/100ft3

Propane Consumption: 61,949 gallon/yr

| Emission Factor in lb/gal | Pollutant | | | | | |
|--|-----------|----------|----------|-------|--------|--------|
| | PM* | PM10* | SO2 | NOx | VOC | CO |
| | 4.00E-04 | 4.00E-04 | 1.60E-05 | 0.014 | 0.0005 | 0.0019 |
| Vaporizer #1-8 Potential Emission in tons/yr | 0.01 | 0.01 | 0.00 | 0.43 | 0.02 | 0.06 |

Methodology

1 gallon of propane has a heating value of 90,500 Btu (use this to convert emission factors to an energy basis for propane)

(Source - AP-42 (Supplement B 10/96) page 1.5-1)

Propane Consumption (gals/year) = 8 (vaporizers) * Fuel Consumption (gal/hr) x 8,760 hrs/yr / 2000 (lb/ton)

Emission Factors are from AP42 (Supplement B 10/96), Table 1.5-1

Emission (tons/yr) = Propane Consumption (gals/yr) x Emission Factor (lb/gal) / 2,000 lb/ton

Appendix A: Emission Calculations

App A, Page 3 of 8

Flare 1 (F-1) Emissions

Company Name: Koch Fertilizer Storage and Terminal Company
Address City IN Zip: 7438 East County Road 800S, Walton, IN 46994
Permit Number: 017-16725-00042
Plt ID: 017-00042
Reviewer: ERG/KC
Date: 11/14/2002

Fuel Type: Propane

Pilot Idling (Propane Combustion Only)

Hours of Idling: 8,520 hr/yr
Sulfur Content of Fuel: 0.16 gr/100ft3
Maximum Propane Consumption by Flare: 272.89 ft3/hr
Fuel Heat Content During Idling: 2,516 Btu/scf
Maximum Propane Consumption During Idling: 2,325,061 ft3/yr

| Emission Factor in lb/MMBtu | Pollutant | | | | | |
|-----------------------------------|-----------|----------|----------|-------|----------|----------|
| | PM* | PM10* | SO2 | NOx | VOC | CO |
| | 4.37E-03 | 4.37E-03 | 1.75E-04 | 0.153 | 5.46E-03 | 2.08E-02 |
| F-1 Potential Emission in tons/yr | 0.01 | 0.01 | 0.00 | 0.45 | 0.02 | 0.06 |

Methodology

1 gallon of propane has a heating value of 90,500 Btu (use this to convert emission factors to an energy basis for propane)

(Source - AP-42 (Supplement B 10/96) page 1.5-1)

Fuel heat content during idling is 2,516 Btu/scf. This was obtained from the National Propane Gas Association.

Emission Factors are from AP42 (Supplement B 10/96), Table 1.5-1

Emission (tons/yr) = Propane Consumption (ft3/yr) x Emission Factor (lb/MMBtu) / 10⁶ (Btu/MMBtu) * Heat Content (Btu/scf) / 2,000 lb/ton

Appendix A: Emission Calculations

App A, Page 4 of 8

Flare 1 (F-1) Emissions

Company Name: Koch Fertilizer Storage and Terminal Company
Address City IN Zip: 7438 East County Road 800S, Walton, IN 46994
Permit Number: 017-16725-00042
Plt ID: 017-00042
Reviewer: ERG/KC
Date: 11/14/2002

Flaring (Ammonia and Propane Combustion)

Hours of Flaring: 240 hr/yr
Sulfur Content of Fuel: 0.16 gr/100ft3
Maximum Propane Consumption by Flare: 19,073 ft3/hr
Fuel Heat Content During Flaring: 750 Btu/scf
Maximum Propane Consumption During Flaring: 4,577,495 ft3/yr
Maximum Ammonia Consumption by Flare During Flaring: 18,800 ft3/hr
Maximum Ammonia Consumption by Flare During Flaring: 4,512,000 ft3/yr

Ammonia Consumption Emissions

Molecular Weight: 44 lb/lb mol
Temperature: 60 F
Gas Constant: 0.7302 (atm*ft3)/(lb mol*R)
Pressure: 1 atm
NOx Emission Factor: 3.3 lb Nox/ton ammonia
Mols of Ammonia Combusted per year: 11,883 mol/yr
Pounds Ammonia Combusted per year: 202,010 lb/yr
Pounds NOx emitted per year: 333 lb/yr
Tons Nox emitted per year: 0.17 ton/yr

Propane Consumption Emissions

| | Pollutant | | | | | |
|-----------------------------------|-----------|----------|----------|-------|----------|----------|
| | PM* | PM10* | SO2 | NOx | VOC | CO |
| Emission Factor in lb/MMBtu | 4.37E-03 | 4.37E-03 | 1.75E-04 | 0.153 | 5.46E-03 | 2.08E-02 |
| F-1 Potential Emission in tons/yr | 0.01 | 0.01 | 0.00 | 0.26 | 0.01 | 0.04 |

Methodology

1 gallon of propane has a heating value of 90,500 Btu (use this to convert emission factors to an energy basis for propane)

(Source - AP-42 (Supplement B 10/96) page 1.5-1)

Fuel heat content during idling is 2,516 Btu/scf. This was obtained from the National Propane Gas Association.

Emission Factors are from AP42 (Supplement B 10/96), Table 1.5-1

Emission (tons/yr) = Propane Consumption (ft3/yr) x Emission Factor (lb/MMBtu) / 10*6 (Btu/MMBtu) * Heat Content (Btu/scf) / 2,000 lb/ton

Appendix A: Emission Calculations

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Flare 2 (F-2) Emissions

Company Name: Koch Fertilizer Storage and Terminal Company
Address City IN Zip: 7438 East County Road 800S, Walton, IN 46994
Permit Number: 017-16725-00042
Plt ID: 017-00042
Reviewer: ERG/KC
Date: 11/14/2002

Fuel Type: Propane

Pilot Idling (Propane Combustion Only)

Hours of Idling: 8,520 hr/yr
Sulfur Content of Fuel: 0.16 gr/100ft3
Maximum Propane Consumption by Flare: 7 ft3/hr
Fuel Heat Content During Idling: 2,516 Btu/scf
Maximum Propane Consumption During Idling: 59,640 ft3/yr

| | Pollutant | | | | | |
|-----------------------------------|-----------|----------|----------|-------|----------|----------|
| | PM* | PM10* | SO2 | NOx | VOC | CO |
| Emission Factor in lb/MMBtu | 4.37E-03 | 4.37E-03 | 1.75E-04 | 0.153 | 5.46E-03 | 2.08E-02 |
| F-2 Potential Emission in tons/yr | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |

Methodology

1 gallon of propane has a heating value of 90,500 Btu (use this to convert emission factors to an energy basis for propane)

(Source - AP-42 (Supplement B 10/96) page 1.5-1)

Fuel heat content during idling is 2,516 Btu/scf. This was obtained from the National Propane Gas Association.

Emission Factors are from AP42 (Supplement B 10/96), Table 1.5-1

Emission (tons/yr) = Propane Consumption (ft3/yr) x Emission Factor (lb/MMBtu) / 10⁶ (Btu/MMBtu) * Heat Content (Btu/scf) / 2,000 lb/ton

Appendix A: Emission Calculations

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Flare 2 (F-2) Emissions

Company Name: Koch Fertilizer Storage and Terminal Company
Address City IN Zip: 7438 East County Road 800S, Walton, IN 46994
Permit Number: 017-16725-00042
Plt ID: 017-00042
Reviewer: ERG/KC
Date: 11/14/2002

Flaring (Ammonia and Propane Combustion)

Hours of Flaring: 240 hr/yr
Sulfur Content of Fuel: 0.16 gr/100ft3
Maximum Propane Consumption by Flare: 14,061 ft3/hr
Fuel Heat Content During Flaring: 750 Btu/scf
Maximum Propane Consumption During Flaring: 3,374,640 ft3/yr
Maximum Ammonia Consumption by Flare During Flaring: 13,500 ft3/hr
Maximum Ammonia Consumption by Flare During Flaring: 3,240,000 ft3/yr

Ammonia Consumption Emissions

Molecular Weight: 44 lb/lb mol
Temperature: 60 F
Gas Constant: 0.7302 (atm*ft3)/(lb mol*R)
Pressure: 1 atm
NOx Emission Factor: 3.3 lb Nox/ton ammonia
Mols of Ammonia Combusted per year: 8,533 mol/yr
Pounds Ammonia Combusted per year: 145,060 lb/yr
Pounds NOx emitted per year: 239 lb/yr
Tons Nox emitted per year: 0.12 ton/yr

Propane Consumption Emissions

| | Pollutant | | | | | |
|-----------------------------------|-----------|----------|----------|-------|----------|----------|
| | PM* | PM10* | SO2 | NOx | VOC | CO |
| Emission Factor in lb/MMBtu | 4.37E-03 | 4.37E-03 | 1.75E-04 | 0.153 | 5.46E-03 | 2.08E-02 |
| F-2 Potential Emission in tons/yr | 0.01 | 0.01 | 0.00 | 0.19 | 0.01 | 0.03 |

Methodology

1 gallon of propane has a heating value of 90,500 Btu (use this to convert emission factors to an energy basis for propane)

(Source - AP-42 (Supplement B 10/96) page 1.5-1)

Fuel heat content during idling is 2,516 Btu/scf. This was obtained from the National Propane Gas Association.

Emission Factors are from AP42 (Supplement B 10/96), Table 1.5-1

Emission (tons/yr) = Propane Consumption (ft3/yr) x Emission Factor (lb/MMBtu) / 10*6 (Btu/MMBtu) * Heat Content (Btu/scf) / 2,000 lb/ton

Appendix A: Emission Calculations
Fugitive Emission From Unpaved Roads

App A, Page 7 of 8

Company Name: Koch Fertilizer Storage and Terminal Company
Address City IN Zip: 7438 East County Road 800S, Walton, IN 46994
Permit Number: 017-16725-00042
Plt ID: 017-00042
Reviewer: ERG/KC
Date: 11/14/2002

1998 Final Version of AP-42 Ch. 13.2.2.

$$E \text{ (lb/VMT)} = \frac{k (s/12)^a (W/3)^b [(365-p)/365] (S/15)}{(M_{dry}/0.2)^c}$$

| Constant | PM10 | PM |
|----------|------|-----|
| k | 2.6 | 10 |
| a | 0.8 | 0.8 |
| b | 0.4 | 0.5 |
| c | 0.3 | 0.4 |

| Factors | Semi-Trucks | Pickups |
|-------------------------------------|-------------|---------|
| s (silt content %) | 5 | 5 |
| W (weight, tons) | 13 | 2 |
| p (rain days) | 125 | 125 |
| M _{dry} (moisture content) | 0.2 | 0.2 |
| S (vehicle speed, mph) | 10 | 10 |

| | Semi-Trucks | Pickups |
|-----------------|-------------|---------|
| PM E (lb/VMT) | 4.53 | 1.78 |
| PM10 E (lb/VMT) | 1.02 | 0.48 |

| | Semi-Trucks | Pickups |
|-------------------|-------------|---------|
| Vehicles/year | 22710 | 730 |
| Miles traveled | 0.43 | 0.43 |
| Miles traveled/yr | 9789 | 315 |

Note: Semi-truck data based on the maximum output of ammonia and the 20 ton/truck. Pickup data based on 8/15/97 permit application.

| Emissions | Semi-Trucks | Pickups |
|-----------|-------------|---------|
| PM | 22.17 | 0.28 |
| PM10 | 4.98 | 0.08 |

2001 Draft Version of AP-42 Ch. 13.2.2

$$E \text{ (lb/VMT)} = k (s/12)^a (W/3)^b [(365-p)/365]$$

| Constant | PM10 | PM |
|----------|------|------|
| k | 1.5 | 4.9 |
| a | 0.9 | 0.7 |
| b | 0.45 | 0.45 |

| Factors | Semi-Trucks | Pickups |
|--------------------|-------------|---------|
| s (silt content %) | 5 | 5 |
| W (weight, tons) | 13 | 2 |
| p (rain days) | 125 | 125 |

| | Semi-Trucks | Pickups |
|-----------------|-------------|---------|
| PM E (lb/VMT) | 3.38 | 1.45 |
| PM10 E (lb/VMT) | 0.87 | 0.37 |

| | Semi-Trucks | Pickups |
|-------------------|-------------|---------|
| Vehicles/year | 22710 | 730 |
| Miles traveled | 0.43 | 0.43 |
| Miles traveled/yr | 9789 | 315 |

Note: Semi-truck data based on the maximum output of ammonia and the 20 ton/truck. Pickup data based on 8/15/97 permit application.

| Emissions | Semi-Trucks | Pickups |
|-----------|-------------|---------|
| PM | 16.53 | 0.23 |
| PM10 | 4.25 | 0.06 |

Appendix A: Emission Calculations

App A, Page 8 of 8

Propane Tank Loading Emissions

Company Name: Koch Fertilizer Storage and Terminal Company
Address City IN Zip: 7438 East County Road 800S, Walton, IN 46994
Permit Number: 017-16725-00042
Plt ID: 017-00042
Reviewer: ERG/KC
Date: 11/14/2002

| | | |
|----------------------------------|----------------------|-------------------------|
| Maximum Gallons: | 659,309 gal | |
| Number of trucks unloading prop. | 66 truck/yr | assume 10,000 gal/truck |
| Hose Length: | 20 ft | |
| Hose Diameter: | 3 in | |
| Volume of Hose: | 0.98 ft ³ | |
| | 7.34 gal | |
| Propane Density: | 4.24 lb/gal | |
| Assume entire hose is emitted | | |
| VOC emitted per year: | 2055.14 lb/yr | |
| | 1.03 ton/yr | |